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TWO NEW GENERA AND TWO NEW SPECIES
OF WESTERN PACIFIC SNAKE-EELS
(APODES: OPHICHTHIDAE)

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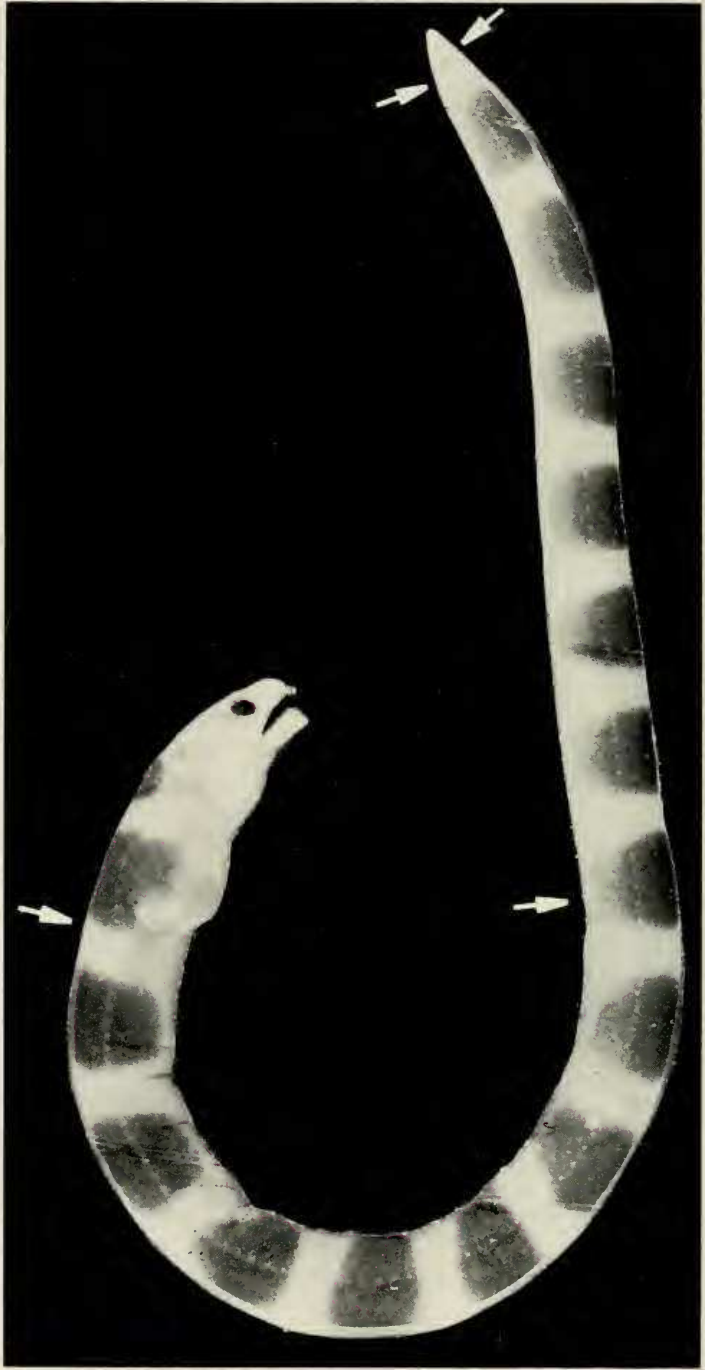
ABSTRACT. Two new species representing two new genera of ophichthid eels, subfamily Ophichthinae, are described from the western Pacific Ocean. *Evips percinctus*, from Palau, and *Allips concolor*, from Thailand, are described and figured.

INTRODUCTION

Examination of the extensive collections of Indo-Pacific fishes deposited at the California Academy of Sciences has disclosed the presence of two new species of ophichthid eels, subfamily Ophichthinae, each of which is distinctly different from any member of a known genus. Difficulty in obtaining specimens of sand-dwelling eels has been noted in recent works (McCosker and Rosenblatt, 1972), yet the two individuals upon which this report is based represent but a small fraction of the numerous ophichthids, moringuids, and xencongrids collected by the George Vanderbilt and Naga expeditions to the central and western Pacific Ocean. It is the author's intent in this study to make these generic names available in preparation for his more thorough osteological comparison of genera within the family Ophichthidae.

Measurements are straight-line, made either with a 300 mm. ruler with

¹Contribution from the Scripps Institution of Oceanography, University of California, San Diego.



0.5 mm. gradations (for total length, trunk length, and tail length) and recorded to the nearest 0.5 mm., or with dial calipers (all other measurements) and recorded to the nearest 0.1 mm. Head length is measured from the snout tip to the posterodorsal margin of the gill opening; trunk length is taken from the end of the head to mid-anus; body depth does not include the fin. Branchiostegal and vertebral counts (which include the hypural) were made using radiographs. Gill arches were prepared by means of the Taylor (1967) trypsin technique. Material used in this study is housed in the California Academy of Sciences (CAS) or the Marine Vertebrates Collection of the Scripps Institution of Oceanography.

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TAXONOMY

Evips McCosker, new genus

DIAGNOSIS. Body nearly cylindrical, head and trunk longer than tail. Dorsal and anal low, ending before pointed tail tip; dorsal origin above and slightly behind gill openings. Pectoral rudimentary and less than eye diameter, its base in upper corner of gill opening. Gill openings lateral and shorter than isthmus breadth. Underside of snout not grooved. Anterior nostril tubular, posterior nostrils open into mouth. Teeth pointed; intermaxillary teeth largest and depressible, vomerine teeth smaller and fixed. Eye large. Other characters those of the single species.

TYPE SPECIES. *Evips percinctus* McCosker, new species.

ETYMOLOGY. From the Greek $\epsilon\upsilon$ (eu, latinized to ev for euphony before a vowel), good, and $\iota\psi$ (ips, masculine), a worm, in reference to the general appearance of this charming eel.

RELATIONSHIPS. *Evips percinctus* appears most closely related to the more generalized ophichthines such as species of *Ophichthus*, *Microdonophis*, and *Pogonophis*. Similarities among these genera include the retention of the pectoral and median fins, the lateral slightly restricted gill opening, the posterior nostril and head pore conditions, and the generally bold coloration. Osteologically, *E. percinctus* also appears similar to them in its pectoral girdle and hyoid arch conditions (viewed from radiographs and cleared and stained specimens) and in the condition of the gill arches, primarily the retention of the fifth ceratobranchial and the separation of UP_3 and UP_4

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FIGURE 1. *Evips percinctus* McCosker, new species, CAS no. 13966, holotype, 125.5 mm. TL. Arrows indicate the origin and termination of the median fins.

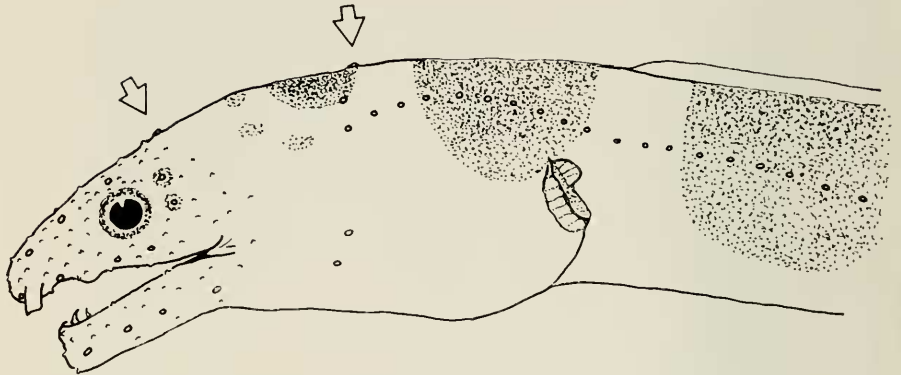


FIGURE 2. *Evips percinctus* McCosker, new species, CAS no. 13966, holotype. Arrows indicate location of median interorbital and temporal pores.

(Nelson, 1966; personal observation). The new genus is separable from these and other ophichthines on the basis of its rudimentary pectoral fin, robust body, and short tail.

***Evips percinctus* McCosker, new species.**

(Figures 1-3.)

Holotype and only known specimen, CAS no. 13966, a 125.5 mm. juvenile from Kayangel Island, Palau Islands, Southern Caroline Archipelago ($8^{\circ}02'18''N.$, $134^{\circ}43'21''E.$), collected in shallow water (0-4') by H. A. Fehlmann and party during the George Vanderbilt Foundation 1956 Palau Islands Expedition, on 8 October 1956.

DESCRIPTION. (Measurements are in millimeters.) Total length 125.5, head 14.0, trunk 60.0, tail 51.5, predorsal 17.2, body depth behind gill opening 5.2, at anus 4.5, snout length 2.8, upper jaw 4.8, eye diameter 1.4, interorbital width 1.5, gill opening height 0.9, isthmus width 3.1. Vertebrae 132; 69 to anal fin origin.

Body stout (not exceedingly elongate as in many ophichthids) and nearly cylindrical. Depth behind gill openings 24 times in total length, and at anus 28; width behind gill openings 31 times in total length, and at anus 34. Snout blunt. Lower jaw included, its tip beneath a line drawn from anterior nostril base. Eye large, about 3.4 times in upper jaw, its center opposite midpoint of upper jaw. Anterior nostrils tubular, about 1.5 in eye diameter. Posterior nostrils open into mouth and lie ahead of anterior margin of eye. Tongue adnate. Branchial basket expanded and supported by numerous branchiostegals and jugostegalia which broadly overlap along the ventral midline. Numerous papillae on snout, beneath eye, and on anterolateral flanges of upper lip (fig. 2). Dorsal origin above and slightly behind gill

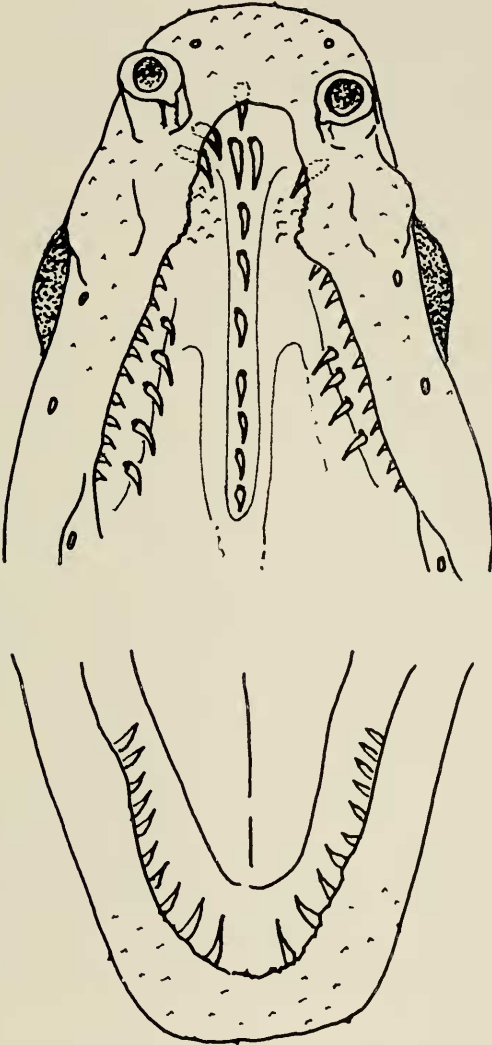


FIGURE 3. Dentition of holotype of *Evipis percinctus* McCosker, new species.

opening. Pectoral fin rudimentary, a small semicircular flap, about equal in length to anterior nostril and attached above midpoint of gill opening. Dorsal and anal low, disappearing in advance of tail tip. Caudal rays lacking.

Head pores conspicuous; preoperculomandibular, temporal, suborbital, postorbital, and supraorbital series present (fig. 2). A single median interorbital and temporal pore. Two postocular pores, lying within faintly pig-

mented spots. Left lateral line pores 125; 9 before gill opening and 73 before the anus, terminating 0.3 head length before tail tip.

Teeth pointed and depressible (fig. 3). Four anterior peripheral intermaxillary teeth covered by skin folds, flanking a median intermaxillary pair, followed by seven uniserial vomerine teeth. Maxillary teeth biserial, the outer row covered by a skin fold and larger anteriorly, the inner 4 prominent. Mandibular teeth uniserial, about 10 on each side and grading smaller posteriorly.

Gill arches removed, and cleared and stained. First basibranchial ossified, second cartilaginous, third rudimentary, fourth absent. Hypobranchials 1 and 2 ossified, 3 cartilaginous. Ceratobranchials 1-5 ossified, the fifth a slender filament. Second and third infrapharyngobranchials ossified. Lower pharyngeal tooth plate slender with about 25 conical biserial teeth. Upper pharyngeal tooth plate (UP₃ and UP₄ of Nelson, 1966) separate (unfused) and subrectangular, with about 15 conical teeth.

Color in isopropanol yellow, overlain dorsally with 16 brown saddles. First saddle just behind occiput, does not reach sides of head; remaining 15 extend below lateral midline but do not meet ventrally. The type has retained traces of larval pigmentation, visible as 9 minute black pigment patches evenly spaced along the ventral midline of the trunk. Median fins unpigmented.

ETYMOLOGY. From Latin, signifying banded throughout.

Allips McCosker, new genus

DIAGNOSIS. Body very elongate, nearly cylindrical for most of its length; head and trunk longer than tail. Dorsal and anal low and lying within a shallow groove, ending before bluntly pointed tail tip; dorsal origin well behind gill openings. Pectoral rudimentary, a tiny flap in upper rear corner of gill opening. Gill openings lateral and low on sides, separated by an isthmus wider than their length. Underside of snout grooved. Jaw teeth and vomerine teeth small and pointed. Eye minute. Other characters those of the single species.

TYPE SPECIES. *Allips concolor* McCosker, new species.

ETYMOLOGY. From the Greek ἄλλος (allos), another, and ἴψ (ips, masculine), a worm.

RELATIONSHIPS. *Allips concolor* appears most similar to extant species of *Bascanichthys*, *Phaenomonas*, and *Gordiichthys*. The last is a poorly known ophichthid excluded from the recent generic treatment of Rosenblatt and McCosker (1970). It will be redescribed on the basis of new material by James E. Böhlke (personal communication). *Allips* differs from *Bascanichthys* in having a more posterior dorsal fin origin, a more rounded snout, and a more cylindrical trunk and tail. The two genera are quite similar in having

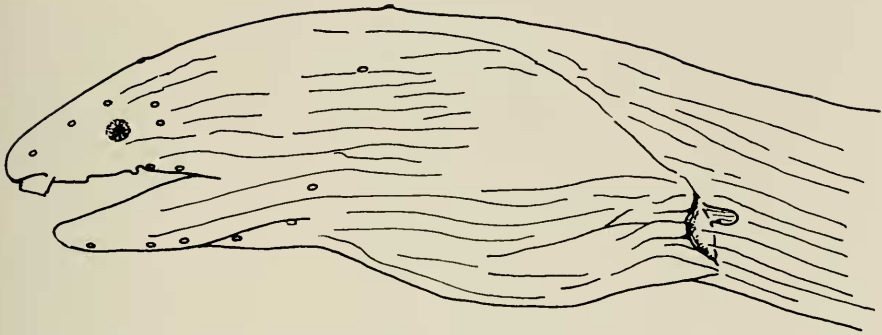


FIGURE 4. Head of holotype of *Allips concolor* McCosker, new species, CAS 13967, 375 mm. TL.

small nearly fixed teeth, comparable gill arch configurations (although the fifth ceratobranchial, absent in *Allips*, is very reduced but retained in certain species of *Bascanichthys*), low crescentic gill openings, rudimentary pectoral fins, a grooved snout, reduced eyes, highly rugose skin regions, a nearly uniform coloration (although certain species of *Bascanichthys* are often darkly pigmented dorsally), and similar head and body shapes and proportions. *Phaenomonas* differs in its extreme dorsal fin reduction, complete loss of the pectoral and anal fins, smaller eye, and the elongation of the trunk region.

Allips concolor McCosker, new species.

(Figures 4-5.)

Holotype and only known specimen, CAS no. 13967, a 375 mm. specimen from Goh Phi, Ranong Province, Thailand ($10^{\circ}57'42''N.$, $98^{\circ}35'18''E.$), north of Ban Parknam Ranong. Collected in shallow water (0-3') at the mouth of Pakehan river by H. A. Fehlmann and party during the 1959-1961 Naga Expedition, on 1 June 1960.

DESCRIPTION. (Measurements are in millimeters.) Total length 375, head 21.0, trunk 205, tail 149, predorsal 48, body depth behind gill openings 5.6, at anus 5.0, snout length 3.0, upper jaw 5.2, eye diameter 0.6, interorbital width 2.6, gill opening height 1.7, isthmus width 2.6. Vertebrae 174; 96 to anal fin origin.

Body elongate and nearly cylindrical, becoming laterally compressed only near tail tip. Depth behind gill openings 67 times in total length, and at anus 75; width behind gill openings 83 times in total length, and at anus 86. Snout subconical, rounded at tip. Lower jaw included, its tip behind anterior nostrils. Eye small, 8.5 in upper jaw, and faintly visible under skin; its midpoint closer to corner of mouth than snout tip. Anterior

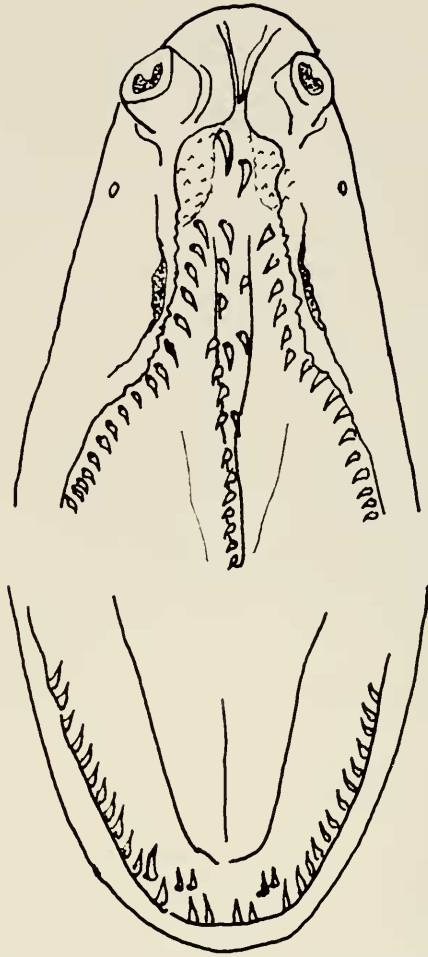


FIGURE 5. Dentition of holotype of *Allips concolor* McCosker, new species.

nostrils in a short tube; posterior nostrils open into mouth beneath eye. Tongue adnate. Branchial basket expanded and supported by 21 pairs of branchiostegals and jugostegalia which broadly overlap along ventral midline. Sides of head, throat, chin, and body flanks markedly rugose. Dorsal fin origin well behind gill openings. Pectoral fin rudimentary, a small flap attached to upper rear margin of gill opening. Dorsal and anal fins low, lying within a groove and disappearing 0.85 head length before finless caudal tip. The median and posterior caudal edges are covered with a band of numerous small papillae.

Head pores reduced, but preoperculo-mandibular, temporal, suborbital,

postorbital, and supraorbital series present (fig. 4). A single median interorbital and temporal pore. Lateral line canal and pores present, but impossible to discern because of their reduced state and a waxy precipitate which has formed in preservation.

Teeth small, pointed, and close set (fig. 5). Jaw teeth and posterior vomerine teeth uniserial.

Gill arches removed, and cleared and stained. First basibranchial ossified, second cartilaginous, third absent, fourth cartilaginous but rudimentary. Hypobranchials 1 and 2 ossified, 3 cartilaginous. Ceratobranchials 1-4 ossified, 5 absent. Second and third infrapharyngobranchials ossified. Upper and lower pharyngeal tooth plates are subrectangular patches with conical teeth; UP_3 and UP_4 separate.

Color in isopropanol nearly uniform brown although slightly darker on upper half due to small dark punctations.

ETYMOLOGY. From Latin, in reference to the nearly uniform coloration.

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